

HORSEpower

Before the tractor was invented, horses were often the only source of power on the farm. Farmers used horses to supply the power to pull the farm equipment. At this time, horses were also used in coal mines to move coal. This is where the term “horsepower” was first used by James Watt.

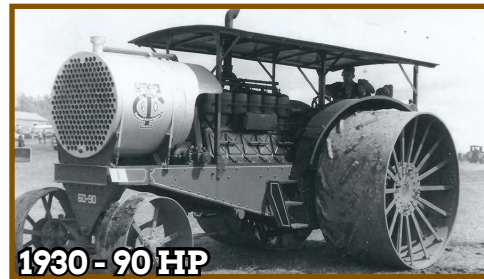


Watt improved the steam engine. As he tried to sell it, consumers wanted to know

how many horses they could replace if they used it. He found he needed to be able to talk about the power one horse could give.

Watt studied the horses being used to move coal in the mines. He found that one horse could pull 330 pounds 100 feet in only 1 minute. James Watt multiplied 330 by 100, then divided that number by 1, and found that pulling 33,000 pounds in 1 minute equals 1 horsepower (hp). Watt stated his steam engine he built could do the same amount of work as five horses.

The power of farm equipment today is still measured using the term horsepower. In 1920, the average horsepower of a farm tractor was 25hp. Today, the average farm tractor is 160hp. John Deere even sells a tractor that has 670hp! To compare, a farmer today can use one 160hp tractor or 160 horses. Which do you think would be a better way to farm?



1930 - 90 HP



2007 - 420 HP



2016 - 670 HP

QUESTIONS

Do you think it would be easier to farm with horses or with a tractor? Explain your reasoning.

Do you think farmers would be able to produce the same amount of food, in the same amount of time, if they still used horses instead of tractors? Explain your reasoning.



Technology in Agriculture

What does it take to feed the world? A little rain, a little sun and a lot of technology! Farming practices have changed through the years. Today farmers can grow more food with less time and work. In order to grow food, farmers must plant seeds. In order to plant a field of seeds, farmers must plow the field. When a farmer plows a field, they are loosening the soil to prepare it for the seeds to grow.

At one point in time, farmers had to plow a field by hand using a wheeled hand plow. To plow one acre of land, which is about the size of a football field, the farmer spent 96 hours working. When the wooden plow was invented, it could be pulled by a team of oxen or horses. With a wooden plow, farmers could plow an acre of land in only 24 hours.

One of the first examples of better technology in farming is the steel plow. John Deere invented the steel plow in 1837. The steel plow allowed farmers to plow an acre of land in only five to eight hours. In 1849, the first farm steam engine, or tractor as we now call it, was invented. The first tractor that ran on gas was invented in 1890. Tractors continue to change to become more useful. Today tractors are larger and able to pull larger plows. Farmers can now plow an acre of land in less than one hour. If the tractor and plow are

large enough, the farmer can plow an acre in only a few minutes!

As farmers drive a tractor and pull a plow, or other piece of equipment, it is important to drive straight. In order to do this, the farmer can use the hood of the tractor. The farmer can look forward and try to line the hood up with something in the distance, perhaps a tree. But they also need to watch behind them to make sure the equipment is working properly. This can be very difficult.

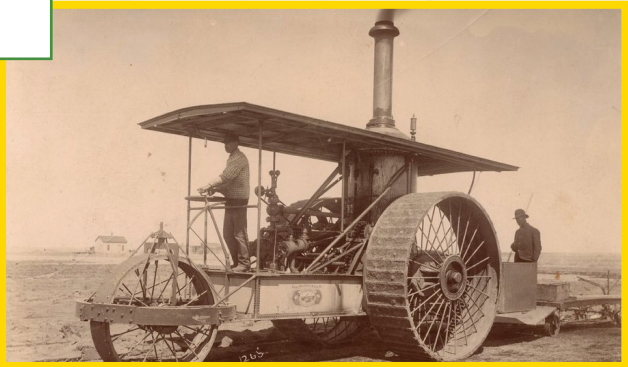
By using GPS to assist them, farmers no longer have to stare at a tree in the distance. They can allow the GPS to guide the tractor and can drive straight. This allows the farmer to watch behind them to make sure the equipment they are pulling with the tractor is working correctly. The use of technology is called Precision Agriculture.

Precision Agriculture has allowed farmers to feed more people. They are able to use fewer people to work on farms. Farmers in Oklahoma, and across the country, use technology to produce more food for a growing world. In 1850, one farmer could feed only 4 people. By 1940, one farmer could feed 19 people. Today, with the use of technology, one farmer is able to feed 155 people.

Oklahoma Ag in the Classroom

Advancements in Agriculture

Using the information you have read, number the pictures to put them in order from the earliest plow (1) to modern day plow (6).



Steam Powered Plow



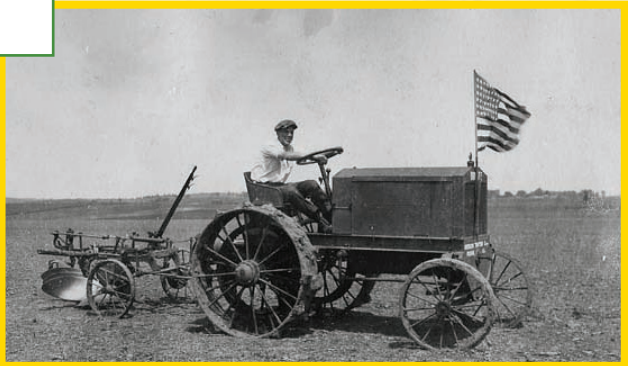
Modern Tractor and Moldboard Plow



Steel Plow



Wheeled Hand Plow



Gas Engine Tractor and Plow



Wooden Plow

Math Plow Problems

If it took a farmer 96 hours to plow one acre of land with a hand plow, how many minutes did it take?

Using a wooden plow, a farmer could farm 1 acre in 24 hours. How many minutes did the farmer spend plowing the acre?

By using the first steel plow, the farmer could plow 1 acre of land in 8 hours. How many minutes is that?

If a farmer owned 160 acres and used a hand plow to farm it, how many hours would it take the farmer to plow the field?

Using the steel plow, how many less hours would the farmer spend plowing the same 160 acres?

If a farmer used a wooden plow to plow 80 acres, how many hours will it take to plow the field?

Using the steel plow, how many less hours would the farmer spend plowing the same 80 acres?

